UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

January 12, 2004

Mr. David A. Christian
Senior Vice President and Chief Nuclear Officer
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SUBJECT: DOMINION NUCLEAR NORTH ANNA, LLC, NRC INSPECTION OF APPLICANT AND CONTRACTOR QUALITY ASSURANCE ACTIVITIES INVOLVED WITH PREPARATION OF THE APPLICATION FOR AN EARLY SITE PERMIT, REPORT 05200008/2003001

Dear Mr. Christian:

On November 20, 2003, the Nuclear Regulatory Commission (NRC) completed a special team inspection of Quality Assurance (QA) procedures and controls at your offices in Glen Allen, Virginia. The enclosed report presents the results of that inspection.

The team concluded that the QA procedures and controls used by the you, your primary contractor, Bechtel, and Bechtel's sub-contractors were equivalent in substance with the criteria contained in Section 17.1.1, Early Site Permit Quality Assurance Controls, of RS-002, Processing Applications for Early Site Permits.

An open item identified during this inspection involved the validation of data obtained directly from publically accessible internet websites for reference in the application. The team was concerned that data posted to websites may not be subject to the same degree of review and verification as data obtained directly from the sponsoring organization, or that malicious computer data tampering could impact the integrity or reliability of the website data. This issue is identified as Open Item 52-008/2003-01-01, "Validation Requirements for Website Data Used in License Applications." The open item will be resolved during completion of the licensing review for the Early Site Permit, and will be closed in the final NRC Safety Evaluation Report (SER), or during a follow-up inspection prior to the issue of the final SER.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system

(ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Mark S. Lesser, Chief
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Division of Reactor Safety

Docket No: 52-008

Enclosure: As Stated

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.	52-008
Report No.	52-008/2003-01
Licensee:	Dominion Nuclear North Anna, LLC
Facility:	Early Site Permit for new nuclear generation at the North Anna site
Location:	Innsbrook Technical Center 5000 Dominion Blvd Glen Allen, VA 23060-6711
Dates:	November 17 - 20, 2003
Inspectors:	J. Blake, Sr. Project Manager, Division of Reactor Safety, RII K. Coyne, Operations Engineer, Quality and Maintenance Section, NRR P. Prescott, Operations Engineer, Quality and Maintenance Section, NRR S. Dennis, Operations Engineer, Quality and Maintenance Section, NRR
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Enclosure

EXECUTIVE SUMMARY

North Anna Early Site Permit
NRC Inspection Report 52-008/2003001

This special team inspection reviewed aspects of applicant and contractor Quality Assurance (QA) and Quality Control (QC) activities involved with preparation of the application for the North Anna Early Site Permit.

The team concluded that the QA procedures and controls used by the applicant, Dominion Nuclear North Anna, LLC; the primary contractor, Bechtel; and sub-contractors were equivalent in substance to the criteria contained in Section 17.1.1, Early Site Permit Quality Assurance Controls of RS-002, Processing Applications for Early Site Permits.

An open item identified during this inspection involved the validation of data obtained directly from publically accessible websites for reference in the application. The team was concerned that data posted to websites may not be subject to the same degree of review and verification as data obtained directly from the sponsoring organization, or that malicious computer data tampering could impact the integrity or reliability of the website data. This issue is identified as Open Item 52-008/2003-01-01, “Validation Requirements for Website Data Used in License Applications.” The resolution of the open item will be determined during completion of the licensing review for the Early Site Permit.

Report Details

Status

On September 25, 2003, Dominion Nuclear North Anna, LLC (Dominion) submitted an application for an early site permit (ESP) in accordance with 10 CFR 52, Subpart A, Early Site Permits.

The site selected for the ESP is a parcel of land on the North Anna Power Station (NAPS) site in Louisa County, Virginia, approximately 40 miles north-northwest of Richmond, Virginia. Other existing nuclear facilities licensed by the NRC are located on the NAPS site. These other facilities are NAPS Units 1 and 2 (NRC Docket Nos. 50-338/339) and the North Anna Independent Spent Fuel Storage Installation (ISFSI) (NRC Docket No. 72-16.)

A Site Safety Analysis Report (SSAR) supports Dominion's application for the ESP. The SSAR contains information about site safety, emergency preparedness, and quality assurance. Chapter 17, Quality Assurance, includes the Quality Assurance (QA) Program under which the ESP application was prepared. This inspection (in accordance with Inspection Procedure 35006,) was conducted to assess the validity of the SSAR data, by the determination of whether the QA program, applicable to elements of the ESP activities, was implemented without substantive deviations.

Quality Assurance

1. QA Manual/Control Documents

   a. Inspection Scope

      For specific organizations with quality assurance/quality control (QA/QC) responsibilities, the team reviewed the QA manuals, or applicable QA control framework documents, to determine if requirements for quality-related activities were consistent with the guidance contained in Section 17.1.1, Early Site Permit Quality Assurance Controls of RS-002, Processing Applications for Early Site Permits.

   b. Observations and Findings

      Dominion Quality Assurance Manual

      The team reviewed the Dominion Early Site Permit Application Development Quality Assurance Manual. The manual delineates the QA Plan for the development of an ESP application for Dominion. The manual was developed using guidance from the American Society of Mechanical Engineers (ASME) NQA-1-2000. The manual's QA program outlined the organization, programs, and procedural requirements.

      In order to simplify the QA process, the applicant invoked portions of the Dominion operating QA program. However, the operating QA program, VEP-1-5A, "Operational Quality Assurance Topical Report," was developed to specifically exclude construction activities. The Early Site Permit Application Development Quality Assurance Manual provided details for construction QA processes that can be interchanged with appropriate sections of the operating QA program.

In a letter to NRC dated September 16, 2002, Dominion submitted a QA plan for the ESP project. The stated purpose of the QA plan was for performance of ESP activities described in 10 CFR 52.17, "Contents of Applications." The plan described a QA program that could be readily implemented should Dominion decide to accelerate the process for obtaining a limited work authorization, combined license, or construction permit. The staff determined that the proposed QA plan appropriately addressed the criteria in Section 17.1.1 of RS-002, however the staff did make several comments concerning areas for improvement. During this inspection, the team's review of revision two of the Dominion ESP QAM, it was noted that these comments had been addressed.

Bechtel Quality Assurance Manual

Dominion selected Bechtel as the lead contractor for ESP application activities. Bechtel provided a Nuclear Quality Assurance Manual (NQAM), which identified requirements for the development of quality program projects, such as the Dominion ESP application. The QA program policies contained in the NQAM were designed to meet the requirements of 10 CFR 50 Appendix B, and contained QA policies corresponding to each of the 10 CFR 50 Appendix B criteria. The NQAM was used to develop the Quality Assurance Program Plan (QAPP) specific to the Dominion ESP application quality assurance effort.

The stated purpose of the QAPP was to establish the quality program interface between the Bechtel NQAM and Dominion's specific requirements applicable to the ESP application development activities. This QAPP specifically identified the QA policies applicable to the Dominion ESP project, and the requirements contained in the Dominion Early Site Permit Application Development Quality Assurance Manual. The NQAM was developed for the full scope of Bechtel services; while the QAPP specifically identified QA policies applicable to Bechtel's scope of work on the Dominion ESP project.

The QA program established in the QAPP was applicable to the quality related activities Bechtel performed associated with the preparation of the Dominion ESP application. The requirements of the QA Program established in the QAPP were applied in a graded manner commensurate with the importance to safety of the activity being performed. Quality classifications were identified in the Project Design Criteria Document.

Modifications to the QA policies, as appropriate, reflected unique project or applicant requirements. In the event of conflicts, it was noted that the QAPP took precedence over the NQAM. Reporting of defects of noncompliance to the NRC were to be in accordance with 10 CFR 21.

Bechtel Subcontractors with QA Manuals

MACTEC Engineering and Consulting was listed on the Bechtel Evaluated Suppliers List. In accordance with Bechtel Technical Specification 24830-006-SR9-CY00-00001-001, MACTEC developed a specific work plan and quality requirements, in addition to the MACTEC Quality Assurance Project Document (QAPD) for the Dominion ESP activities.

Bechtel subcontracted to Risk Engineering, Inc. (REI) to obtain computational and expert consulting services in performing probabilistic seismic hazard and sensitivity analyses for the North Anna site. The team reviewed the REI QA manual and software quality assurance plan (SQAP) and determined that these quality documents covered all activities important to safety specified in the Bechtel service requisition.

c. Conclusions

The Dominion Early Site Permit Application Development Quality Assurance Manual was basically subdivided into the 18 criteria of 10 CFR 50 Appendix B. The team concluded that each area met the minimum guidance delineated in Section 17.1.1 of RS-002. Additionally, the applicant met the requirements of 10 CFR 21 through their purchase order process.

Bechtel's QAPP adequately met the guidance in Section 17.1.1 of RS-002.

Based on a review of the MACTEC work plan and QAPD, and the REI quality manual and SQAP, the team concluded that QA measures implemented by MACTEC and REI provided reasonable assurance in the integrity and reliability of ESP-related data.

No discrepancies were noted.

2. QA Control Implementation

For each organization with QA/QC responsibilities, the team reviewed QA organizations and responsibilities, implementing procedures, contractual requirements, and work records.

2.A QA Organization

a. Inspection Scope

For specific organizations with QA/QC responsibilities, the team conducted the following reviews:

1. verified that individuals responsible for implementation of the QA/QC procedures or instructions have been identified;
2. determined if qualification requirements for QA personnel had been established for all levels of the organization;
3. assessed the controls for the review and approval of QA procedures and instructions; and
4. reviewed training requirements related to ESP activities to ensure personnel completed requisite training.

b. Observations and Findings

Dominion

The applicant developed procedures specific to ESP activities not covered by the operations QA program procedures. Specific areas where procedures were developed for ESP activities were; project organization and responsibilities, procedure control, personnel qualification and training, ESP application and development, and discrepancy management. The team reviewed the program procedures and noted that the procedures were adequate to meet the guidance in Section 17.1.1 of RS-002. The applicant had clearly delineated the ESP organization and personnel responsibilities.

The team interviewed Dominion quality assurance personnel that conducted audits of ESP activities and reviewed personnel training and qualification records. In addition to routine individual and continuous training, there was training conducted for personnel performing ESP specific activities. The team reviewed ESP-003, "Personnel Qualification and Training," Revision 0, to ensure Dominion personnel followed procedural guidance and requirements for training and qualification and to verify that the procedure was adequate. Also, training records and personnel qualifications were reviewed.

Bechtel

The team reviewed the Bechtel Quality Services Department Procedures Manual (Nuclear), Revision 1, dated July 1998. The Manual was prepared for use by Quality Services Department personnel in performing nuclear power plant related activities for projects administered by Bechtel. Detailed procedures were included in this Manual for those QA functions that were described in the Nuclear Quality Assurance Manual (NQAM). The team reviewed several procedures in detail to ensure the procedures were sufficient in detail to perform the stated procedure purpose. Below are two examples of procedures reviewed by the team.

The team reviewed Bechtel procedure 2QP-Q01N-1812, "Project Quality Assurance Audits," Revision 1. Bechtel met the requirement for auditing design and construction phase project activities at least annually or once within the life of the project, whichever is shorter. The procedure had requirements that auditors be properly qualified, audit implementation guidance, audit report documentation, and audit follow up and closeout guidance. The team found these requirements had been met.

The team reviewed Bechtel procedure 2QP-Q01N-0312, "Qualifications of Auditors," Revision 1, dated July 1998. The auditor qualification requirements were in conformance to 10 CFR 50 Appendix B and consensus standards. Topics such as training audit participation, examination, and maintenance of auditor qualifications were detailed in the procedure.

The team reviewed training and qualification records for Bechtel personnel and other subcontractors involved in Dominion ESP related activities. In addition, the Bechtel organization chart and personnel responsibilities were reviewed.

MACTEC Engineering and Consulting

Bechtel subcontracted to MACTEC Engineering and Consulting, Inc., to obtain geological testing support. Consistent with the requirements of the Bechtel Technical Specification, MACTEC developed a project-specific work plan to identify the scope of work activities, and quality requirements in addition to the MACTEC QAPD. The team review the MACTEC QAPD and the project work plan to assess the adequacy of the specified QA measures, particularly those associated with test control. The team noted that the MACTEC quality assurance organization was independent of the organizations performing field or lab work and reported directly to the senior project principal engineer and project manager. Furthermore, the team noted that the work plan provided the following specific requirements relating to testing, field oversight, and record control:

- Section 4.2, "Inspection Control," stated that all applicable field activities will be observed and documented by the MACTEC site supervisor or the rig geologist or rig geotechnical engineers. Additionally, all field work will be submitted and reviewed by the principal geotechnical engineer.

- Section 4.6, "Control of Measuring and Test Equipment (M&TE)," stated that MACTEC will calibrate, adjust and maintain their M&TE in accordance with the MACTEC Calibration Manual. The work plan also stated that subcontractors will control M&TE in accordance with applicable MACTEC purchase order requirements and their respective QA programs, plans and procedures.

- Section 2.8, "Field Records," stated that a MACTEC geologist or geotechnical engineer will be at the drill rig during drilling, sampling, and observation well installation. The work plan also stated that the geologist will keep records of drilling conditions and MACTEC subcontractors will maintain field records of their work for cone penetrometer and seismic cross hole testing.

Risk Engineering, Incorporated

Bechtel subcontracted to Risk Engineering, Inc. (REI) to support Bechtel's ESP efforts in performance of probabilistic seismic hazard and/or sensitivity analyses for the North Anna site. REI is a small company (six personnel) and has no stand alone QA organization.

Risk Engineering Incorporated delineated the functional personnel titles necessary to define the QA program. The position of President includes the responsibility for preparation and revision of the QAM and associated procedures. The QAM identified the QA Manager as the management position having overall authority and responsibility for QA controls. This individual had the authority to report a QA non-conformance directly to the client and NRC.

The Quality Review position assured that project documents and reports maintained the requisite completeness, adequacy, technical accuracy and conformance to quality requirements. The QAM required the reviewer to be an independent person not connected with generation of the original work, who was qualified to review and judge

work quality. The QAM also stated that all REI team members had access to management levels to express any quality concern.

Qualification requirements of QA personnel were established in the QAM and verified by the team. The QAM also stated that REI personnel working on QA-related work must attend QA training before performing QA-related activities and job responsibilities and authorities. The QA training scope included applicable codes, standards and company procedures, and applicable QA program elements. Training procedures were specified in Section 2.3 of the QAM and in Section 13 of the Software Quality Assurance Plan (SQAP).

All training was documented in the appropriate Training Record and Project Meeting Logs, as stated in the procedures, and audited by Bechtel. REI provided training as required and training record documents were stored in the software-specific QA records. Based on the Bechtel's first audit, training records were found for only one individual for a previous project. In the second audit, Bechtel reviewed training records of the personnel involved in the ESP project, and found them to be in compliance with the QAM. The team verified that procedures for training on QA control requirements was conducted and documented.

c. Conclusions

Based on a review of the ESP QA implementing procedures, training records, qualification records, organizational responsibilities documents and interviews with personnel directly involved in Dominion ESP activities, the team determined that specific personnel conducting ESP activities were adequately trained and qualified. Also, the procedures for conducting ESP activities and training were adequate and met the guidance outlined in Section 17.1.1 of RS-002.

No deficiencies were noted.

2.B. Design Control

a. Inspection Scope

The team reviewed the implementation of QA design control attributes applicable to ESP activities at the proposed site. The team interviewed cognizant applicant and contractor personnel, and reviewed applicant, contractor, and sub-contractor procedures to verify that adequate controls existed regarding ESP design control activities.

b. Observations and Findings

The Dominion ESP application identified Bechtel Power Corporation as the primary contractor providing personnel, systems, project management, and resources for the Dominion ESP project. Further, Bechtel procured engineering services and support for specific design control activities from subcontractors Risk Engineering, Inc and MACTEC Engineering and Consulting. The team reviewed and verified the adequacy of design control activities for each of these companies.

Dominion Energy

The team reviewed Dominion procedures describing design control measures in the areas of design verification, computer software control, engineering drawings, design calculations, personnel training, design deviations, internal and external design control communications, design documentation, organizational responsibilities, and field changes and revisions as follows.

The Dominion Early Site Permit Quality Assurance Manual delineated the QA plan for development of an Early Site Permit application and further described personnel roles and responsibilities for those involved in the project. The manual stated that the Nuclear Design Control Program (NDCP) delineated procedures to assure that design basis, regulatory requirements, codes, and standards were correctly translated into specifications, drawings, procedures, or instructions. The Dominion procedures VEP-1-5A, Operational Quality Assurance Program Topical Report, Nuclear Standards, and Engineering Standards further described the design control program. As stated in the QA Manual, the procedures for design controls, analysis, and review included, as part of their basis, ANSI N45.2.11-1974 as modified in the QA Program Topical Report.

Section 17.2.3 of VEP-1-5A provided a description of the Nuclear Design Control Program (NDCP) and described the overall design control attributes, qualification of nuclear oversight personnel, and measures established to assure regulatory requirements were met. The NDCP described a more detailed program for preparing, reviewing, maintaining, and approving procedures and standards to ensure compliance and consistency with 10 CFR 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings. The NDCP also provided for verification and/or independent review of the adequacy of design through design reviews, use of alternate calculational methods, or by performance of tests. The procedure stated that if a testing program is solely used to test the adequacy of design, the test will be conducted under adverse design conditions.

The Nuclear Design Control Manual (NDCM) provided procedures for overall design and document control for Dominion nuclear engineering department personnel. Included in the procedures were requirements for interfaces with other Dominion departments to ensure continuity and verification in engineering and other design control activities. The team review included the following NDCM sections:

- NDCM 3.3, “Design Verification,” established the requirements for reviews and verifications of design changes and other engineering products such as specifications, drawings, and calculations.

- NDCM 3.7, “Calculations,” provided guidelines and requirements for the preparation, review, approval, control, and revision of calculations, including those used in computer codes.

- NDCM 3.21, “Software Control,” established responsibilities, requirements, and instructions for controlling software used in the design control program. It included requirements for code validation, design reviews, and code changes.

Additional sections of the NDCM that were reviewed are listed in the documents reviewed section of this report. The team found all of these sections of the NDCM to be consistent with the guidance of Section 17.1.1 of RS-002.

Bechtel Power Corporation

Dominion established the ESP work scope and quality requirements for Bechtel Power Corporation in Dominion Purchase Order (PO) No. 70105833. The purchase order included a detailed description of Bechtel's work scope, including identification of specific sections of the ESP application for which Bechtel was responsible for performing design control activities supporting analyses, evaluations, procurement, and ensuring personnel involved with the project were trained and knowledgeable of the QA design control requirements. Additionally, Bechtel was responsible for implementing procedural controls to identify and correct deviations from quality standards.

Dominion specified that materials and services supplied by Bechtel were nuclear safety-related and that Bechtel should implement a quality control and assurance program that complied with 10 CFR 50, Appendix B, and ANSI N45.2. Bechtel implemented the ESP project quality requirements specified in a project specific Quality Assurance Program Plan (QAPP). The Bechtel QAPP invoked the quality policies contained in the Bechtel QA Manual that were applicable to the ESP project.

In accordance with specifications contained in the Dominion PO, Dominion approved the Bechtel QAPP for use during the North Anna ESP project. The team interviewed several Bechtel engineering personnel regarding their familiarity and understanding of the ESP QA control requirements contained in the QAPP and other procedures and found them to be knowledgeable of those requirements.

The team also reviewed Bechtel procedures describing design control measures in the areas of design verification, computer software control, engineering drawings, design calculations, personnel training, design deviations, internal and external design control communications, design documentation, organizational responsibilities, and field changes and revisions as follows.

- The team reviewed section 3.1 of the QAPP and Bechtel procedure 3DP-G04-00001, and found that requirements for preparation, review, approval, and control of design criteria were clearly stated and in accordance with ANSI N45.2.11 and/or NQA-1. Additionally, the Bechtel Engineering Department Project (EDP) procedure regarding engineering control, defined the requirements for preparation and control of ESP project and task design criteria including the standards, codes, regulations, and design bases used for the project. The team verified that the procedure provided the means to coordinate and communicate design criteria changes (including revision control) throughout any affected project discipline group. The procedure also specified internal document management requirements including record retention.

- The team reviewed section 3.2 of the QAPP and Bechtel Engineering Department Instruction, 3DP-G04-00025, to verify that controls existed for design control interfaces between Bechtel internally and external non-Bechtel

(contractor) organizations. The procedure defined responsibilities for internal and external organization personnel including communication, documentation, and distribution of design control criteria. This included control of design input and development, special analysis, and approvals. Responsibilities were also defined regarding action to be taken to verify traceability and appropriateness of information prior to its use in any design document.

- Section 3.3 of the QAPP and Bechtel procedure 3DP-G04-00027 described responsibilities and requirements for the verification of design work performed internally, including non-generic computer software verification requirements. The team verified that requirements were defined for performance and documentation of design verification on structures, systems, and components (SSCs) important to safety for the ESP. The team verified that procedural controls and descriptions existed for design verification either by interdisciplinary design review, independent off-project design review by technical staff personnel, or individual critical design review. Once selected, the procedure specified that the verification method was documented with concurrence and that deviations were justified and documented.

- Design change controls were described in section 3.4 of the QAPP. The team verified that the procedure specified requirements to control changes to the design of SSCs important to safety after the initial design was complete and that the procedure included requirements for review and independent verification of those changes. Additional controls are part of procedures 3DP-G04G-00036, Design Calculations, and 3DP-G04-00046, Engineering Drawings which both specify engineering responsibilities and requirements for initial as well as revised or changed documents and drawings affecting the ESP project.

Risk Engineering, Inc.

Bechtel subcontracted to Risk Engineering, Inc. (REI) to support Bechtel's ESP efforts in performance of probabilistic seismic hazard and/or sensitivity analyses for the North Anna site.

The REI Quality Assurance Manual (QAM) and Software Quality Assurance Plan (SQAP) were used by REI as a guidance in the development of engineering documents. The SQAP is a supplement of the QAM, and includes procedures related to the development, verification, validation, and documentation of the software used in quality assurance calculations. A list of the software covered by the SQAP was presented in the scope of the QAM. Software tools, techniques and methodologies, including review of calculations and software tests were clearly stated by REI. Reference documents, media control, and record collection, as well as organizational responsibilities were detailed in both manuals (QAM and SQAP). Quality control procedures were available and documented in Section 2 of the QAM and covered both the QAM and the SQAP. Software specific documents such as Software Requirements, Software Documents for Design, User's Manual, Verification-Validation (V&V) Plan, and V&V Review Reports were included for each of the software revisions. The SQAP included V&V and Review

Report plans to ensure proper documentation of errors and deficiencies as well as any corresponding corrective action.

The team held a meeting with Dr. Robin McGuire, REI President, to obtain a greater understanding of the computer program scope and obtain computer software verification information, including an overview of software documents, to review the methodology and QA controls used by REI in calculations and analyses. Also, documentation for each program code was reviewed, including software requirement design documents, user's manuals, V&V plans, and V&V review reports. The team found that in each revision of the program code, updates from previous versions were addressed, and the QAM included procedures for review of calculations and validation of computer program software results.

MACTEC Engineering and Consulting

Bechtel subcontracted to MACTEC Engineering and Consulting, Inc., to obtain geological testing support. MACTEC utilized the services of five additional suppliers in order to complete the scope of work outlined in the Bechtel project Technical Specification. These suppliers performed work activities associated with surveying, drilling, geologic testing, and laboratory analyses. Review and discussion of MACTEC inspection efforts is discussed in Section 2.c, Procurement Control, and Section 2.d, Supplier Contractor/Surveillance, of this report.

QA Measures for Control of Publically Accessible Internet Data

The team also noted that in several instances, the applicant used publically accessible internet web sites to obtain information referenced in the ESP application. For example the ESP application referenced internet web sites controlled by the United States Department of Commerce, Bureau of the Census (2000); the town of Mineral, Virginia; and the Kings Dominion Amusement Park, to establish population distributions and growth estimates near the North Anna site.

The National Oceanic and Atmospheric Administration (NOAA) website data was used, in part to establish the meteorologic profile for the planned ESP site. During the inspection, the applicant could not produce objective evidence that demonstrated that the applicable website data was identical to the official data controlled by the website sponsoring organization.

In reviewing the Census Bureau and NOAA websites used by Bechtel, the team noted that each of these agencies offered certification services to verify that data supplied to users was identical to the agency officially archived data. NOAA indicated in publication Environmental Information Summary C-1, "Weather Records in Private Litigation," that in accordance with 28 U.S.C 1733, only properly authenticated copies or transcripts of records can be admitted as evidence in a court of law. Consequently, NOAA offered a data certification service to authenticate data. Similarly, the Census Bureau offered a certification service for their archived data.

Bechtel stated that these government certifications were not obtained for the data obtained directly from the Census Bureau or NOAA websites in the ESP application.

The team was concerned that data posted to websites may not be subject to the same degree of review and verification as data obtained directly from the sponsoring organization or that malicious computer data tampering could impact the integrity or reliability of the website data. This issue is identified as Open Item 52-008/2003-01-01, "Validation Requirements for Website Data Used in License Applications."

c. Conclusions

The QA procedures and controls used by Dominion, Bechtel and sub-contractors were readily available and were equivalent in substance to the criteria contained in Section 17.1.1 of RS-002, Early Site Permit Quality Assurance Controls. Applicant and contractor personnel involved with the ESP project were cognizant and knowledgeable of the QA design control requirements contained in the applicable procedures, and had received adequate training in their areas of responsibility. The team concluded that an adequate scope of QA controls existed in the design control area pending resolution of the open item.

2.C Procurement Control

a. Inspection Scope

The team reviewed the implementation of QA controls for procurement of services by the applicant and the applicant's contractors and sub-contractors. The team reviewed purchase orders, work scope technical requirements, project plans, supplier quality assurance programs, and methods used by purchasing organization to qualify suppliers of safety-related services.

b. Observations and Findings

Section 1.4 of the Dominion ESP application identified Bechtel Power Corporation as the primary contractor providing personnel, systems, project management, and resources for the Dominion ESP project. Further, Bechtel procured engineering services and support from four additional subcontractors in support of the ESP project: Tetra Tech NUS, Inc; MACTEC Engineering and Consulting, Inc.; Risk Engineering, Inc.; and William Lettis & Associates, Inc. As described below, the team reviewed the procurement controls applied to each of these suppliers.

Bechtel Power Corporation

The applicant established work scope and quality requirements for Bechtel in Dominion Purchase Order (PO) No. 70105833. The purchase order included a detailed description of Bechtel's work scope, including identification of specific sections of the ESP application for which Bechtel was responsible for performing supporting analyses, evaluations and investigations. Dominion specified that materials and services supplied by Bechtel were nuclear safety-related and that Bechtel implement a quality control and assurance program that complied with 10 CFR 50, Appendix B, and ANSI N45.2.

Additionally, Dominion specified that 10 CFR 21, "Reporting of Defects and Non-Compliance," applied to the Bechtel purchase order. The team reviewed Dominion Safety Related Vendor List and verified that Bechtel was listed as an active safety-related vendor, qualified to supply design and engineering services for major projects, including the ESP project.

Bechtel implemented the ESP project quality requirements specified in PO No. 70105833 in a project specific Quality Assurance Program Plan (QAPP) for the North Anna Early Site Permit Project. The Bechtel QAPP invoked the quality policies contained in the Bechtel QA Manual that were applicable to the ESP project. In accordance with specifications contained in Dominion PO, Dominion approved the Bechtel QAPP for use during the North Anna ESP project.

In developing the QAPP, Bechtel determined that certain quality policies contained in the Bechtel Nuclear Quality Assurance Manual were not applicable to the ESP project, including: control of supplier and subcontractor nonconformances; identification and control of materials, parts, and components; control of special processes; control of status items; control of nonconformances; significant reportable deficiencies; and construction/site services quality assurance records.

Although some of these activities, such as control of special processes and construction records, were clearly not applicable to the scope of Bechtel's involvement in the ESP project, the team questioned why control of nonconformances was not applicable to the ESP project since nonconformance controls could be used to address deviations in ESP engineering services supplied by vendors.

Bechtel personnel stated that the Bechtel nonconformance quality policies were intended to address hardware procurement nonconforming conditions. Bechtel personnel noted that deviations in ESP project engineering services from procurement specifications would be addressed under the other processes that were applicable to the ESP project such as the Supplier Deviation Disposition Process, the Engineering Error Report process, or the Corrective Action Request process. The team reviewed these other deviation reporting processes and found that Bechtel had implemented sufficient measures to provide reasonable assurances that nonconformances in procured engineering services could be identified and corrected.

The team reviewed the scope of the QAPP, including quality related activities determined to be not applicable to the ESP project, and found that the QAPP was consistent with Dominion Early Site Permit Application Development Quality Assurance Manual, Revision 2, dated August 29, 2003. The quality elements covered by the Bechtel QAPP were also consistent with the scope of work outlined in Dominion PO No. 70105833. Additionally, the team found that the QAPP controls were reasonable and consistent with the guidelines contained in Section 17.1.1 of RS-002. Therefore, the team determined that the procurement of engineering services from Bechtel complied with the Dominion ESP QA manual requirements and was consistent with the procurement controls specified in Dominion procedure Nuclear Design Control Manual (NDCM) 3.6, "Procurement of External Engineering Services."

MACTEC Engineering and Consulting

Bechtel subcontracted to MACTEC Engineering and Consulting, Inc., to obtain geological testing support. The scope and specifications for MACTEC activities were documented in Bechtel Technical Specification 24830-006-SR9-CY00-00001-001, "Technical Specification for Subsurface Investigations and Laboratory Testing." Section 1.1, "General," of the Technical Specification specified that MACTEC's QA program shall meet 10 CFR 50, Appendix B, and comply with 10 CFR 21.

MACTEC Engineering and Consulting, located in Raleigh, NC, was listed on the Bechtel Evaluated Suppliers List as an acceptable supplier of Geotechnical subsurface investigations, sampling and material laboratory services. The Bechtel supplier evaluation was based on a supplier audit of MACTEC in November 2002 and an evaluation of the MACTEC Quality Assurance Project Document (QAPD). Bechtel documented the review of the MACTEC QA program in accordance with Procedure 3DP-G06G-000111, "Evaluation of Supplier Quality System or Quality Assurance Program Requirements." Bechtel concluded that MACTEC maintained a acceptable QA program that met the requirements of ANSI N45.2 and 10 CFR 50.

Consistent with the requirements of the Bechtel Technical Specification, MACTEC developed a project specific work plan to identify the scope of work activities and quality requirements in addition to the MACTEC QAPD. The team reviewed the MACTEC QAPD and the project work plan to assess the adequacy of the specified QA measures, particularly those associated with test control.

The team noted that the MACTEC quality assurance organization was independent of the organizations performing field or lab work and reported directly to the senior project principal engineer and project manager. The team found that the MACTEC QAPD and work plan provided adequate measures for the control of MACTEC work activities. Furthermore, the team noted that the work plan provided the following specific requirements relating to testing, field oversight, and record control:

- Section 4.2, "Inspection Control," stated that all applicable field activities will be observed and documented by the MACTEC site supervisor or the rig geologist or rig geotechnical engineers. Additionally, all field work will be submitted and reviewed by the principal geotechnical engineer.

- Section 4.6, "Control of Measuring and Test Equipment (M&TE)," stated that MACTEC will calibrate, adjust and maintain their M&TE in accordance with the MACTEC Calibration Manual. The work plan also stated that subcontractors will control M&TE in accordance with applicable MACTEC purchase order requirements and their respective QA programs, plans and procedures.

- Section 2.8, "Field Records," stated that a MACTEC geologist or geotechnical engineer will be at the drill rig during drilling, sampling, and observation well installation. The work plan also stated that the geologist will keep records of drilling conditions and MACTEC subcontractors will maintain field records of their work for cone penetrometer and seismic cross hole testing.

Based on review of the MACTEC QAPD and the project work plan, the team found that MACTEC identified a reasonable scope of QA measures to ensure the integrity and reliability of site geological test data.

MACTEC utilized the services of five additional suppliers in order to complete the scope of work outlined in the Bechtel project Technical Specification. These suppliers performed work activities associated with surveying, drilling, geologic testing, and laboratory analyses. Work instructions provided by MACTEC to these subcontractors were reviewed by the MACTEC project principal engineer, the project manager, and a representative from the QA organization. Additionally, in discussions with the team, the MACTEC project principal engineer stated that all subcontractors performing site work were trained on the MACTEC QA program and the requirements of 10 CFR 21.

In general, field and laboratory testing activities were conducted in accordance with recognized testing methods from the American Society for Testing and Materials (ASTM) or the Environmental Protection Agency (EPA). The applicant described deviations from these testing methods in Appendix B, Section 2.5.4, "Geotechnical Tests," of the ESP application. As described below, the team reviewed the work scope and applied QA measures applicable to each of the five MACTEC subcontractors:

- Applied Research Associates, South Royalton, VT

  Applied Research Associates (ARA) provided geological testing support for the performance of cone penetromemeter and seismic characterization testing. The MACTEC project work plan stated that cone penetrometer testing and seismic downhole testing were to be performed in general accordance with ASTM D-5778, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils," and ASTM D-4428/4428M, "Standard Test Methods for Crosshole Seismic Testing," respectively. In addition to these ASTM standard tests, ARA also utilized standard operating procedure ARA-Q-104, "ARA Cone Penetrometer Standard Operating Procedures," Revision 8, July 23, 2002. The team noted that ARA-Q-104 included guidance for equipment field verification procedures, testing instructions, and requirements for test records.

  The MACTEC work instructions, applicable to ARA activities, stated that work was to be performed in accordance with NQA-1. The MACTEC principal project engineer stated that MACTEC had previously reviewed ARA for compliance with NQA-1 to support cone penetrometer work at the Savannah River Site. Additionally, MACTEC personnel stated that they had reviewed ARA technical capability and personnel qualifications during the vendor procurement process.

  Based on a review of MACTEC work instructions governing ARA work activities, discussions with MACTEC personnel, and the basis for qualification of ARA as a supplier of ESP related services, the team found that the MACTEC implemented reasonable measures to ensure that data collected by ARA was accurate and reliable.

- Grumman Geophysics, Columbus, Ohio

  Grumman Geophysics conducted crosshole and downhole seismic testing at the North Anna site as a subcontractor to MACTEC. The MACTEC work plan specified that crosshole testing was to be performed in general accordance with ASTM D 4428/D 4428M, "Standard Test Methods for Crosshole Seismic Testing." In Appendix 2.5.4B, "Final Report Results of Geotechnical Exploration and Testing North Anna ESP Project Louisa County, Virginia," of the ESP application, MACTEC identified specific deviations from the ASTM D 4428/D 4428M test methods.

  Downhole seismic testing was performed in accordance with the Grumman Standard Operating Guideline A.0, "Downhole Seismic Testing." The team reviewed Standard Operating Guideline A.0 and determined that it provided adequate instructions for the performance of downhole seismic testing.

  The MACTEC work instructions for the Grumman work scope stated that the work was to be done under a QA program compliant with NQA-1. MACTEC personnel stated that Grumman was qualified as a supplier for the ESP project based on a prior contract with MACTEC under the vendor procurement process and review of past work, personnel qualifications and equipment information. However, in discussions with the team, the MACTEC senior principal project engineer stated that MACTEC provided continuous oversight over Grumman field activities.

  Based on a review of MACTEC work instructions governing Grumman activities, discussions with MACTEC personnel, and the oversight provided for Grumman field activities by MACTEC personnel, the team found that MACTEC implemented reasonable measures to ensure that data collected by Grumman was accurate and reliable.

- Stantec Consulting, Richmond, VA

  MACTEC subcontracted to Stantec Consulting to perform topographical surveys to locate geologic boreholes and exploration points. MACTEC personnel stated that Stantec was qualified as a supplier based, in part, on a review of QA program, technical procedures, equipment, calibration methods, and personnel qualifications. The team reviewed a sampling of survey results and verified that survey data was certified by a Stantec land surveyor licensed by the Commonwealth of Virginia.

  Based on a review of MACTEC work instructions governing Stantec activities, discussions with MACTEC personnel, and the use of survey personnel licensed by the Commonwealth of Virginia, the team found that MACTEC implemented reasonable measures to ensure that survey data collected by Stantec was accurate and reliable.

- Bedford Well Drilling, Bedford, VA

  MACTEC subcontracted to Bedford Well Drilling to drill boreholes and install casings for crosshole seismic work. Although Bedford Drilling was a licensed contractor in the Commonwealth of Virginia, they did not maintain a quality assurance program that was compliant with 10 CFR 50, Appendix B or NQA-1. However, the MACTEC principal project engineer stated that MACTEC provided continuous surveillance of the site activities conducted by Bedford Drilling.

  The team reviewed the work activities conducted by Bedford Drilling and found that, given the limited nature of the work activities and the oversight provided by MACTEC, the activities performed by Bedford Drilling were adequately controlled for the purposes of the ESP site characterization studies.

- Severn Trent Laboratory, Savannah, GA

  MACTEC subcontracted to Severn Trent Laboratory to obtain soil chemistry testing services. MACTEC specified that laboratory testing was to be accomplished in accordance with Environmental Protection Agency testing standard SW-846 requirements. MACTEC qualified Severn Trent as a supplier for ESP services based, in part, on the performance of a MACTEC procurement process quality assurance audit conducted in April, 2002. Although the audit was associated with work at the Savannah River Site, the MACTEC senior principal project engineer stated that the North Anna ESP work scope was similar to the work performed at the Savannah River site.

  Based on a review the scope of laboratory testing activities, discussions with MACTEC personnel, and the results of the MACTEC vendor audit, the team found that activities performed by Severn Trent were adequately controlled for the purposes of the ESP site characterization studies. These controls provided reasonable assurance of the accuracy and reliability of ESP data provided by Severn Trent.

Based on a review of the vendor supplier documents associated with the Bechtel qualification of MACTEC and MACTEC's qualification of subcontractors, the team found that appropriate quality assurance measures were applied to supplier selection and procurement control activities. Furthermore, MACTEC implemented adequate quality assurance measures to provide reasonable assurance in the integrity and reliability of data obtained during site characterization testing.

Risk Engineering, Inc.

Bechtel Service Requisition 24830-006-SR4-HAWC-00001-002, specified that Risk Engineering, Inc. (REI) provide their QA manual (QAM) for Bechtel approval. Additionally, Section 3.0 of the service requisition specified that all work be performed under a QA program in accordance with 10 CFR 50, Appendix B and in compliance with the requirements of 10 CFR 21. REI maintained a QAM and Software Quality Assurance Plan (SQAP) that were both submitted to Bechtel.

Bechtel project management and quality assurance personnel reviewed and accepted the Risk Engineering QAM and SQAP. Additionally, Bechtel performed supplier audits of REI in November 2002 and June 2003. On the basis of a review of their QA program and supplier audits, REI was added to the Bechtel Evaluated Suppliers List and identified as a supplier with a quality assurance program consistent with specifications of ANSI N45.2.

William Lettis & Associates

The team reviewed the Bechtel Service Requisition No. 24830-006-SR4-CY06-00001-000, "Geologic Mapping and Characterization of Seismic Sources." The requisition outlined Bechtel's request for technical services from Lettis for the collection and evaluation of data that was used as a basis for the preparation of sections 2.5.1 through 2.5.3 of the SSAR.

Technical services were requested in the form of field and office studies designed to meet Appendix D of Regulatory Guide (RG) 1.165, "Identification and Characterization of Seismic Sources and Determination Safe Shutdown Earthquake Ground Motion," for the identification and characterization of seismic source zones in the region around the North Anna site. The studies also addressed investigation of the potential for active tectonic deformation (permanent ground displacement) at and within the vicinity of the site in accordance with Appendix D of RG 1.165. The document also outlined the applicable codes and standards. Notwithstanding, the subcontractor was required to perform work in accordance with all the latest relevant and applicable regulatory guides and NRC guidance.

Because Lettis did not possess a quality assurance program that complied with the requirements of 10 CFR 50 Appendix B, Lettis was required to perform the work in accordance with Bechtel's QA program, as described by the Bechtel Quality Assurance Program Plan (QAPP) and the implementing procedures for the QAPP contained in Bechtel's Project Engineering Procedures Manual (PEPM).

Per the Service Requisition, Lettis was required to: 1) integrate Bechtel's QAP requirements into the subcontractor's work processes and before starting work, submit a summary work plan and schedule confirming an understanding of the work; 2) ensure that all Lettis personnel performing work undergo QA training by Bechtel; 3) check for proper implementation of the QA requirements as the work progressed; 4) allow access to their facilities and records for QA inspection and audit purposes by Bechtel or Dominion; 5) Lettis would identify and document all deviations from the requirements of the Service Requisition; and 6) the Service Requisition required identification of 10 CFR 21 requirements.

The team reviewed Bechtel's "Geologic Field Reconnaissance Work Plan," dated June 19, 2003. The Work Plan described the objectives, activities to be performed, and methods of investigation to be used by Lettis in the geologic field reconnaissance. It outlined: the objectives (development of maps of the site and area); activities to be performed (geologic field reconnaissance and related research); methods of investigation (mapping techniques and field reconnaissance); and quality control of the geologic field reconnaissance.

The "Geologic Field Reconnaissance Work Plan," section 4.0, Methods of Investigation, stated that the general geologic and geomorphic mapping techniques, including descriptions of rock and soil units, collection of structural and stratigraphic data, analysis of aerial photography, and plotting of geologic features on a topographic base map shall follow the generally accepted procedures outlined in Compton's 1985, "Manual of Field Geology."

In that Lettis did not have specific procedures, the team reviewed the Compton's manual to determine its adequacy to provide direction for the conduct of the required activities. The review found that there appeared to be sufficient guidance, assuming adequate personnel knowledge, to conduct such activities. A review of Lettis personnel qualifications indicated the staff had adequate knowledge and experience to conduct the required activities.

Tetra Tech NUS

As described in Bechtel Service Requisition No. 24830-006-SR4-HY00-00001-000, dated November 15, 2002, the scope of work performed by Tetra Tech was limited to preparation of certain portions of the ESP environmental report. Bechtel identified this work as non-safety-related, therefore the quality requirements specified in the service requisition required only that Tetra Tech have a quality assurance program compatible with the provisions and requirements of International Standard ISO 9000, "Quality systems - Model for quality assurance in design/development, production, and servicing." The team reviewed the Tetra Tech work scope and concluded that, because the work scope was limited to development of the environmental report, quality assurance controls equivalent in substance to 10 CFR 50, Appendix B, were not required.

c. Conclusions

Based on a review of procurement documents associated with services supplied by Dominion's contractors and subcontractors in support of the North Anna ESP application and discussions with Dominion Energy, Bechtel, Risk Engineering, and MACTEC personnel, the team concluded that procurement activities for ESP activities important to safety were adequately controlled. In particular, Dominion and its contractors and subcontractors implemented procurement quality assurance measures that provide reasonable assurance in the integrity and reliability of site data used to support the ESP application.

2.D Supplier Contractor/Surveillance

a. Inspection Scope

The team reviewed supplier audit activities applicable to the procurement of technical services from contractors and subcontractors in support of the ESP application. The team also reviewed procurement surveillance activities implemented by the applicant and their subcontractors to assess if the applicant adequately monitored and controlled ESP-related activities performed by contractors and suppliers. The team review of contractor surveillance activities included the scope and depth of audited activities, and

identification and resolution of deficiencies. The results of the review of procurement audits performed by the applicant and the applicant's prime contractor are described below:

b. Observations and Findings

Bechtel Power Corporation

The applicant listed Bechtel Power Corporation listed on the Dominion Safety Related Vendor List as a supplier qualified to supply design and engineering services for major projects, including the ESP project. Designation of Bechtel as a qualified supplier was based, in part, on two supplier audits that had been conducted within the year proceeding submittal of the ESP application. Specifically, a joint Nuclear Utility Procurement Issues Committee (NUPIC) audit was conducted by Arizona Public Service during the period of November 4-8, 2002, and a Dominion vendor programs audit (Audit No. DA 2003-60) was conducted during the period of July 22-24, 2003.

The purpose of the NUPIC audit was to verify continued satisfactory implementation of the Bechtel Nuclear Quality Program to meet the intent of 10 CFR 50, Appendix B and 10 CFR 21. The scope of the NUPIC audit covered QA activities associated with design control, procurement, document control, and corrective action. The NUPIC audit identified four findings related to software quality assurance and design controls. Bechtel responded to the four findings in letters dated December 5, 2002 and January 23, 2003. Arizona Public Service and the applicant reviewed the corrective actions taken by Bechtel to address these issues and determined that they were adequate to resolve the identified program deficiencies. The team also reviewed Bechtel's corrective actions and determined that they were reasonable and adequately addressed the issues identified by the November 2002 audit.

In June 2003, the applicant performed audit DA 2003-60 to verify the implementation of the Bechtel Quality assurance Program as it related to the North Anna ESP project. The scope of the Dominion audit included review of calculation and software controls, procurement record packages, vendor audits, surveillance reports, and corrective actions. Although no findings were identified during the audit, the applicant noted that Bechtel failed to issue a Project Execution Plan (PEP) in a timely manner. This issue, which was previously self-identified by Bechtel, was resolved following issuance of the PEP by Bechtel. Based on the result of the this audit, the applicant concluded that Bechtel was effectively implementing their quality assurance program and their supporting quality assurance program plan as they relate to the development of the North Anna early Site Permit Project.

Based on a review of the NUPIC and Dominion audits of Bechtel, the team found that vendor audit activities were of sufficient scope and depth to provide reasonable assurance of Bechtel's qualification to perform safety-related work. In particular, the team noted that audit activities included a review of significant quality attributes including design and software control, procurement activities, training, record retention, and corrective action. The team determined that Bechtel adequately resolved deficiencies identified during these supplier audit activities.

MACTEC Engineering & Consulting

The Bechtel Power Corporation performed one supplier audit of MACTEC Engineering in November 2002. The scope of the MACTEC vendor audit covered activities associated with subsurface investigation, sampling, and laboratory testing. The specific audit scope included implementation of 10 CFR 21, inspection and testing, instrument calibration, and procurement.

Bechtel identified four findings during the audit related to: (1) the failure to implement procedures for 10 CFR 21 and the failure to pass 10 CFR 21 requirements down to subcontractors; (2) the failure to issue purchase orders for certain calibration services; (3) the failure to approve calibration service providers; and (4) the failure to ensure that up to date versions of the MACTEC QA Manual were promulgated throughout the company.

MACTEC responded to these issues in a letter dated November 18, 2002, and provided a description of the actions taken to address identified findings. Bechtel reviewed these corrective actions and closed the audit findings in a letter to MACTEC dated November 25, 2002. The team reviewed the MACTEC corrective actions for the audit findings and considered them to be reasonable. The team found that the Bechtel supplier audit of MACTEC was of sufficient scope and depth to provide reasonable assurance of MACTEC's qualification to perform safety-related work.

The team also reviewed an internal quality assurance audit performed by MACTEC during the period of July 29 - August 2, 2002. The stated audit purpose was to verify that services provided by MACTEC were being accomplished in compliance with existing technical and quality requirements. The three man audit team was lead by a MACTEC lead auditor.

Activities reviewed during the audit included administrative and technical controls, technical training and professional development, field and laboratory operations, technical reports and files, and Quality Assurance Program implementation. The internal audit team concluded that MACTEC was operating in general conformance with company technical and quality requirements. However, eight audit findings were identified during the audit.

The team noted that a MACTEC internal audit response had been initiated that identified the corrective actions to be taken for each audit finding and the date that the actions would be completed. Discussions with MACTEC personnel indicated that corrective actions had been taken to address the identified findings and to preclude recurrence.

In accordance with the project work plan, MACTEC provided oversight and surveillance for site activities. The team reviewed Quality Assurance Checklists documenting MACTEC Quality Assurance surveillances performed to assure that MACTEC field activities complied with applicable procedures, codes and standards. The QA surveillance checklists pertained to field observations of MACTEC field activities conducted on the dates of November 21-22, 2002, and December 11-12, 2002.

The team determined that the checklists were associated with each section of MACTEC Work Plan Number 1, Revision 0, issued on November 22, 2002. The checklists addressed the salient aspects of each section of the work plan. For example, Section 2.1 of the work plan addressed field requirements associated with Planning and Permitting. The surveillance checklist for that section required verification of weather conditions and preparation of required permits prior to start of field activities. The team noted that the checklist associated with Quality Assurance Program Documentation verified that 10 CFR Part 21 was available for project personnel. The team also noted that no deficiencies were identified during the surveillance activities.

Risk Engineering, Inc.

Bechtel performed an initial supplier audit of Risk Engineering, Inc., in November 2002. The scope of the audit included use of computer programs in safety-related applications, design control, and documentation and control of design inputs. During the audit, Bechtel identified three deficiencies and six observations. The deficiencies were associated with QA record retention requirements, performance of internal audits, and documentation of computer programs. Bechtel documented closure of these findings in a letter dated July 17, 2003. In discussions with the team, the Bechtel QA staff stated that REI was an acceptable supplier with no restrictions on supplying safety-related technical services. The team reviewed the audit deficiencies and found that the corrective actions identified by Risk Engineering were reasonable.

Bechtel performed a follow up audit of Risk Engineering in June 2003. The scope of audit included design control, software development and control, document control, training, QA audit and surveillance, corrective action, reporting of defects under 10 CFR 21, and QA record retention. Bechtel identified one deficiency during this audit involving the failure to document preparer and reviewer signatures on QA documents. By letter dated August 19, 2003, Bechtel reviewed and accepted Risk Engineering's corrective actions for the audit deficiency and observations. The team reviewed these corrective actions and found that the actions were reasonable.

Based on a review of the Bechtel supplier audits of REI, the team found that vendor audit activities were of sufficient scope and depth to provide reasonable assurance of Risk Engineering's qualification to perform safety-related work. In particular, the team noted that audit activities included a review of significant quality attributes related to Risk Engineering work activities, including design and software control, document control and training. The team determined that Bechtel adequately resolved deficiencies identified during these supplier audit activities.

William Lettis & Associates

Because Lettis did not possess a quality assurance program that complied with the requirements of 10 CFR 50 Appendix B, Lettis was required to perform the work in accordance with Bechtel's QA program, as described by the Bechtel QAPP and the implementing procedures for the QAPP contained in Bechtel's Project Engineering Procedures Manual (PEPM).

The team reviewed the Bechtel Service Requisition No. 24830-006-SR4-CY06-00001-000, "Geologic Mapping and Characterization of Seismic Sources." Per the Service Requisition, Lettis was required to: 1) integrate Bechtel's QAP requirements into the subcontractor's work processes and before starting work, submit a summary work plan and schedule confirming an understanding of the work; 2) ensure that all Lettis personnel performing work undergo QA training by Bechtel; 3) check for proper implementation of the QA requirements as the work progressed; 4) allow access to their facilities and records for QA inspection and audit purposes by Bechtel or Dominion; 5) Lettis would identify and document all deviations from the requirements of the Service Requisition; and 6) the Service Requisition required identification of 10 CFR 21 requirements.

Tetra Tech NUS

Although Tetra Tech was identified as a nonsafety-related vendor, Bechtel performed an evaluation of Tetra Tech on May 21, 2003 under the Bechtel procurement program. The evaluation concluded that Tetra Tech implemented an adequate QA program for providing technical services in the areas of environmental reports for the ESP project. Bechtel identified one audit observation requiring a response involving the inadequate control of draft site data in developing the environmental report. Bechtel reviewed the Tetra Tech response to this issue and closed the audit observation by letter dated July 17, 2003.

c. Conclusions

Based on a review of supplier audits conducted by the applicant, contractor, and subcontractors, the team concluded that ESP activities performed by suppliers were adequately monitored and controlled. Supplier audits were of sufficient scope and depth to provide reasonable assurance of supplier conformance with quality assurance requirements. Additionally, suppliers implemented adequate corrective actions to address deficiencies identified during audits.

2.E. Corrective Action

a. Inspection Scope

Corrective action is an area of major importance, therefore, the team reviewed applicant and contractor procedures and instructions covering the identification and correction of the causes of significant deviations relating to site testing and evaluation, or other ESP activities important to safety. The corrective action programs, and the identified problems, were reviewed for the identification and correction of generic deviations, and documentation of corrective actions. Specific examples of identified problems and the resultant corrective actions are detailed in section 2.G, "Audits," of this inspection report.

b. Observations and Findings

Dominion

The applicant had established a process for corrective action measures. The process was outlined in the quality assurance manual, and was controlled in accordance with VEP-1-5A, "Operational Quality Assurance Program Topical Report." Procedure ESP-005, "Discrepancy Management," detailed the requirements for identifying, screening, documenting, resolving and tracking discrepancies associated with the development of the ESP application. Procedure VPAP-1501, "Deviations," detailed specifically the process for identifying and for determining operability and reportability of conditions potentially adverse to quality and operability.

Engineering maintained a program to evaluate design concerns that could lead to adverse quality conditions. The Potential Problem Reporting (PPR) system allowed for detailed, multidisciplined reviews of complex design concerns that may yield a deviation report. The PPR process was detailed in procedure NDCM 6.1, "Potential Problem Reporting System." The PPR system was not a corrective action or commitment tracking system. It was intended to provide a means to analyze and review complex technical concerns that may be significant and may become issues. As outlined in the procedure, other processes handled corrective action and commitment tracking. The applicant's procedures governing the corrective action were found to meet the guidance in Section 17.1.1 of RS-002. As noted in Section 2.G of the inspection report, the team determined that the applicant had properly implemented the corrective action process.

Bechtel

Bechtel's ESP specific Quality Assurance Program Plan stated that for the corrective action program, the "Nuclear Quality Assurance Manual" would be the guiding document. The manual stated that corrective action applies to significant conditions adverse to quality as described in 10 CFR 50, Appendix B, Criterion 16; ANSI N45.2, Section 17; and ANSI/ASME NQA-1. As discussed in Section 2.C of this inspection report, Bechtel's corrective action program included the "Supplier Deviation Disposition" process", the "Engineering Error Report" process, and the "Corrective Action Request" process for the documentation of nonconforming conditions. In addition, the QAPP stated that while performing Bechtel's scope of work, if Bechtel personnel identify a condition adverse to quality in existing Dominion procedures or documentation, such a condition would be documented on a deviation report form in accordance with VPAP-1501 and reported to Dominion for further evaluation and disposition. The team noted that Bechtel personnel implemented the corrective action program as outlined in the QAPP.

c. Conclusions

The team verified that the applicant and associated subcontractors followed the guidance in the governing procedures and documents and adequately implemented a corrective action program. The corrective action program met the guidance in Section 17.1.1 of RS-002.

2.F. QA Record Control

a. Inspection Scope

For each organization with QA/QC responsibilities, the team conducted reviews to verify that procedures and instructions for the generation, control, and use of all QA/QC records addressed appropriate attributes of QA record control.

The QA attributes inspected included: 1) Types of records required for various levels of management reviews; 2) Types of records required at project level for each activity; 3) Standards for content and quality of design and procurement document technical and quality verification records; 4) Assignment of responsibility for records; and 5) Protection and preservation of records.

To accomplish this inspection, project procedures were reviewed to determine records management requirements applicable to QA records, to obtain the information specified in Section 03.02g of Inspection Procedure 35006, and to verify that the applicant's records management requirements are equivalent in substance to measures provided in 10 CFR 50 Appendix B and Section 17.1.1 of RS-002. Records management requirements applicable to the applicant's prime contractor and subcontractors were also reviewed. Audit reports were reviewed for issues and corrective actions related to records. Procedures for turnover of contractor documents to the applicant were reviewed. To assess conditions under which ESP records are maintained, the team conducted a walk-through inspection of the section of the Innsbrook Technical Center Vital Records Vault in which the applicant's ESP records are maintained.

b. Observations and Findings

Dominion's Early Site Permit Application Development Quality Assurance Manual, Revision 2, dated August 29, 2003, stated that elements of the operating QA program shall be used to ensure quality in the ESP project. Section 18 of the QA manual, which addresses QA records, stated that requirements and responsibilities for records transmittal, retention, and maintenance were documented in administrative procedures. Primarily, the existing administrative procedures for Dominion's nuclear plants were used, though several administrative procedures particular to the ESP had been implemented as part of Dominion's ESP Project Manual. The Quality Assurance Manual also referred to VEP-1-5A, Operational Quality Assurance Program Topical Report, as the source of requirements and commitments for retention and storage of QA records.

Section 17.2.17, Quality Assurance Records, of VEP-1-5A (Amendment Five, June 1986, updated March 1998) stated that requirements and responsibilities for QA records transmittal, retention, and maintenance were located in administrative procedures. The section listed examples of QA records applicable to the operating nuclear power plants and stated that records were maintained in accordance with NRC regulations, commitments to ANSI N45.2.9-1974, and administrative requirements. Table 17.2-0 contained statements of commitment to standards, requirements, or guides. It referred to Regulatory Guide 1.88, "Collection, Storage, and Maintenance of Nuclear Power Plant Quality Assurance Records." This Regulatory Guide (withdrawn by the NRC because the ANSI standards endorsed by the Regulatory Guide had been incorporated

into ANSI/ASME NQA-1-1983, and endorsed by Regulatory Guide 1.28) endorsed the requirements and guidelines for records collection, storage, and maintenance in ANSI N45.2.9-1974, subject to certain clarifications and exceptions stated in the Regulatory Guide. Section 17.2.17 of VEP-1-5A also provided descriptions of records retention measures, including having proper indices, an established filing system, and records facilities constructed and secured to prevent destruction of records by fire, flooding, theft, and deterioration through environmental conditions such as temperature and humidity.

The lower-tier operating procedure for records management was VPAP-1701, Revision 15, "Records Management." This procedure established methods, responsibilities, and requirements for creation, collection, storage, maintenance, and disposition of records generated during operations, maintenance, and support of Virginia Power's nuclear power plants. It also described responsibilities of personnel for records management. It was invoked in the ESP project in the ESP Project Manual, Section ESP-004, "ESP Application Development" (June 19, 2003).

VPAP-1701 Section 6.2 contained requirements for quality and legibility of records. Section 6.3 contained requirements for storage and maintenance of records; the section required transmittal of completed records to Records Management within 30 days. Section 6.6 contained requirements for correction of records. Section 6.9 required Records Management to prepare records for archival storage and required a controlled environment. Section 6.10 contained requirements for periodic media inspections to allow detection of unexpected degradation of records.

VPAP-1701 referred to the Nuclear Required Records Lists (NRRLs) for retention requirements. A sample of these lists was reviewed. For each record type, the NRRL listed the controlling Dominion procedure, the retention period, the retaining organization, and applicable regulations or other external documents (e.g., ANSI N45.2.9).

A records management supervisor stated that permanent records submitted as "QA" were kept unless Records Management was instructed to delete them. Records were observed to be retrievable through reference to a file number and vault location.

A sample of document transmittal forms for ESP records was reviewed. The forms included receipt acknowledgment by the Records Management staff. The completed form returned to the originators contains file locations for use in retrieval. It was noted that in some cases originators are using "file" as a document type, rather than the document types in the NRRLs (e.g., analysis, calculation, etc.). Documents so marked may not be as readily retrievable (i.e., cannot predictably be found through search by document type).

DMAP-0901, "Records Retention and Files Management," Revision 8, contained requirements for records storage vaults. This procedure invoked ANSI N45.2.9-1974, unless otherwise explained in VEP-1-5A. The procedure contained specific requirements for vaults and their contents. The team conducted a walk-through inspection of the Innsbrook Technical Center, Vital Records Vault under escort. The vault was found to have limited access, and to be climate controlled and well ventilated.

The vault appeared to be clean, and no obvious evidence of intrusion by water, destructive insects, or other animals was noted.

Records retention requirements for the applicant's prime ESP contractor, Bechtel Power Corporation, were reviewed. Bechtel Nuclear Quality Assurance Manual Quality Policy Q-17.1 provided requirements for design and procurement records retention and turnover. This document stated that QA records will be turned over to Dominion progressively on a task completion basis. Q-17.1 commits to ANSI N45.2.9 and ANSI/ASME NQA-1, Supplement 17S-1 for maintenance and control of records. Once records are turned over to the client, Q-17.1 states that Bechtel is not required to keep copies they retain under controlled conditions per the ANSI standards.

Policy Q-17.2 provides requirements for supplier and subcontractor records. It stated that procurement documents will specify access for Bechtel and client staff to the end of the retention period, which is specified in the Records Retention and Turnover Plan, PAI 2KP-K01G-00021-000 (May 7, 2003) as the end of the contract plus six years. The Plan lists document types to be turned over, either at "Job Completion" or "At Time of Issue."

Interviews with cognizant Dominion and Bechtel staff indicated that few Bechtel records have been turned over to Dominion, even though most Bechtel work for the ESP project was complete. The Bechtel staff stated that Bechtel was revising the procedures to show records turnover by the end of the contract. However, they stated that the plan was to turn over as many documents as possible in the next several months and that a Bechtel staff member was working full time to accomplish this. Whereas Bechtel is shown in the Plan as the record holder for many of the records, Bechtel staff stated that they plan to revise the procedure to show the client (Dominion) as the record holder for most or all records.

Regarding Bechtel's subcontractors, it was noted that the Bechtel Technical Specification for Subsurface Investigations and Laboratory Testing for the North Anna ESP Project invokes 10 CFR Part 50 Appendix B, as well as N45.2-1977, for records management. The Bechtel Service Requisition for Probabilistic Seismic Hazard Assessment and/or Sensitivity Analyses required the subcontractor to submit its QA manual to Bechtel for approval. The NRC inspection team verified that the subcontractor's manual had been submitted to and approved by Bechtel. The Service Requisition also invokes 10 CFR Part 50 Appendix B. The document required the subcontractor to make project documents not turned over to Bechtel available in the subcontractor's offices. The Service Requisition for Geologic Mapping and Characterization of Seismic Sources contained similar requirements.

Bechtel administrative procedure 2KP-K01G-0032, "Supplier Document Management" (Revision 004) provided requirements for processing, controlling, distributing, and maintaining supplier documents. It required that supplier documents received by Bechtel be controlled through Bechtel's InfoWorks data base.

Samples of test records produced by Bechtel subcontractor MACTEC were reviewed by the team. The samples contained descriptions of the activities, dates, and results of the tests, the names of test personnel, and the names of reviewers. In a phone conversation with the team, MACTEC staff stated that all test records for the ESP

application were subjected to QA review and that the test records were being maintained by MACTEC as QA records.

Audit reports were reviewed for records management issues, particularly with regard to Bechtel's subcontractors. Bechtel audited MACTEC's records in November 2002. No findings were written regarding records management. An observation was made regarding methods being used to identify changes to records (e.g., use of correction fluid, line-out without initials). Bechtel also audited Risk Engineering, Inc. (REI) in November 2002, with a finding that there were no QA record retention requirements for computer source codes, user manuals, and validation reports. The finding further noted that were no such requirements for calculations not turned over to the client. REI responded that the REI QA manual would be revised to require permanent retention of all QA records not turned over to the client, including specification of a retention method. Bechtel subsequently closed the finding by verifying that such requirements had been added to Revision 4 of REI's QA manual. A second Bechtel audit in June 2003 reached no findings regarding records management.

A Bechtel internal audit in July/August 2003 resulted in a Corrective Action Request (CAR) which stated that some of the latest required supplier documents were not available in the Project's InfoWorks data base used in retrieving documents. Responsible personnel found that the cause was that the Supplier Documents Overdue log had not been reviewed periodically to determine if documents were in-house that needed disposition by Bechtel. Corrective action was to begin reviewing the log weekly. Verification of the corrective actions was made by Bechtel auditors on August 13, 2003.

An audit of Bechtel Power Corporation was conducted by the Nuclear Utility Procurement Issues Committee (NUPIC) in November 2002. The audit found that records were maintained at Bechtel in a storage system that provides protection and ready retrievability as required by ANSI N45.2.9 and ANSI/ASME NQA-1, Supplement 17S-1. The NUPIC team considered this audit area satisfactory.

c. Conclusions

The team concluded that procedures and instructions for generation, control, and use of QA records appeared to address the information specified in Section 03.02g of Inspection Procedure 35006. The applicant and contractor procedures addressed the types of records required, standards for quality of records, and measures for protection and preservation of records. Review authority for records was addressed in existing station procedures.

The team concluded that records supporting the ESP application were being controlled in a manner equivalent in substance to the measures specified in 10 CFR Part 50 Appendix B, and consistent with the guidance on records management in Section 17.1.1 of RS-002.

2.G. Audits

a. Inspection Scope

The team verified that the applicant (and each subcontractor with QA/QC responsibilities) had detailed procedures/instructions covering the preparations for and conduct of audits. The team reviewed completed audits to verify that these controls for the performance of audits have been adequately implemented.

b. Observations and Findings

Dominion Internal Audits

The team reviewed Audit No. 03-12, "ESP Application Development - Quality Assurance Manual (Special Audit)," dated August 11, 2003. This audit evaluated the translation and implementation of the ESP Application Development Quality Assurance (QA) Manual requirements as related to activities performed by Dominion. The audit was performed to satisfy the requirements of the ESP Application Development QA Manual, Section 19. Activities that were audited included: project team responsibilities; indoctrination and training; handling, storage and shipping; corrective action; records; and QA Manual issuance and revision.

There were no potential problem reporting (PPR) (for design engineering issues), deviations or Nuclear Oversight findings noted. However, there were several recommended enhancements for maintaining the soil samples. It was recommended to identify minimum acceptable storage level standards. There was also noted an intent by the warehouse manager to move the soil samples to another location. The report recommended follow up by ESP project personnel due to the fragility of the soil samples. The report recommended that the sample logbook be identified and maintained as a QA record or duplicated, with one of the copies placed in the Nuclear Project file. The sample jars were looked at to determine if the containers would retain the moisture in the soil. The lid sealing surface appeared to be of a plastic material, not a wax or rubber type. It was recommended additional protection of paraffin wax be added to the jar lid.

The team followed up on the proposed enhancements. A memo dated October 20, 2003, documented that the recommended enhancements in Audit No. 03-12 had been completed. The team noted that an additional logbook, "Soil Sample Inventory Sheets North Anna ESP Project MACTEC Job No. 30720-2-5400," was being retained by the ESP project personnel as a QA record. The team inspected the soil sample storage area. The soil samples appeared to be kept in a proper location with adequate controls. The soil sample jars had been sealed with a wax around the lids.

Bechtel Internal Audits

The team reviewed Bechtel Audit No. 24830-QSHA-03-001, conducted in July 2003. The audit evaluated compliance of the ESP project activities with the applicable quality assurance program (QAP) requirements. The audit noted that the QAP was adequately implemented for the ESP project. One CAR and one observation were identified. The

audit evaluated compliance of Project Engineering, Contracts, and Project Administration activities with the Bechtel nuclear QAP requirements. Audit methodology included a review of selected documents and interviews with responsible personnel.

Areas reviewed by the audit included: project organization; design control; software development and control; indoctrination and training; document control; QA records; and corrective action.

CAR No. 24830-QSHF-03-003 noted that the Project Execution Plan (PEP) was still not finalized, approved, and issued. The team reviewed the PEP and noted it had been approved and issued. There was no adverse impact on the project noted. The observation identified that the Design Control Checklists (DCCLs) for two disciplines were not prepared. The Project Engineer (PE) indicated that regardless of the DCCLs, each application section prepared by the project will be reviewed by the respective chief engineer, per procedure EDPI 4.22, "Licensing Documents for the North Anna Early Site Permit Project." Both the CAR and observation were considered closed.

The team reviewed Bechtel Surveillance Report No. 24830-QSHS-03-002, dated May 28, 2003. It was noted during the Project QA audit of Bechtel Subcontractor, Tetra Tech NUS (Tetra Tech) that Bechtel transmitted a copy of a draft Dominion drawing, Figure 2.1.1, Revision 0A, to Tetra Tech for their use. A Bechtel letter with the drawing stated that the drawing was currently undergoing Dominion review and that it was not final. The drawing was used by Tetra Tech in calculating the enveloping new plant site area for terrestrial impact in their Environmental Report.

The condition was documented on CARs 24830-QSHF-03-001, and 002. The final responses to the two subject CARs were reviewed. The cause was stated as being that the project schedule necessitated that the Tetra Tech work be performed in parallel with the finalization of the Plant Envelope Layout drawing. Thus, a preliminary version of the drawing had been provided to Tetra Tech to expedite their work. The PE failed to include a Project Action Item to keep track of the necessity to provide Tetra Tech the final Plant Envelope Layout drawing. Tetra Tech was requested to send correspondence in which they confirmed the draft document had no impact on the final drawing. Further, CAR 24830-QSHF-03-002 recommended Project Administration, in coordination with Project Engineering, determine the cause and extent of the problem and document results of the investigation. The team could not find any documentation for the corrective actions taken during follow up for CAR 24830-QSHF-03-002. The team determined it did not appear to be a significant issue, as no further examples of draft material being used were found.

The team reviewed Bechtel Audit Checklist No. 24830-QSHA-03-001. This was a Nuclear Audit Checklist that reviewed the licensing documents that were part of the ESP Application which were deliverable documents to Dominion. The documents were in Bechtel's internal review process. A selection of documents in various review stages were chosen. The documents were reviewed against 10 CFR 50 Appendix B. One observation noted during the audit was adequately resolved.

The team reviewed Surveillance No. 24830-QSHS-03-001. The surveillance reviewed ten selected documents for the ESP project. The surveillance was performed to verify compliance to selected administrative attributes. At the time of this surveillance, the project was approximately 20 percent complete. The surveillance noted that overall, the project was following established processes and procedures. However, a number of administrative types of observations were identified. The response to most of the observations were addressed by additional training.

The team reviewed Bechtel memo "DOM ESP Project Master Audit Schedule and Master Audit Plan," dated April 28, 2003. Per Bechtel procedure 2QP-Q01N-1812, Project Quality Assurance Audits," dated July 1998, Bechtel project staff must develop a project audit schedule and outline the proposed activities to be audited. The team found the memo was sufficient in detail to meet the procedure requirements and that audits had been performed as scheduled.

c. Conclusions

The team concluded that internal audits were conducted in accordance with procedures, at an appropriate frequency, by qualified auditors and were of sufficient scope and depth to meet the guidance in Section 17.1.1 of RS-002, Early Site Permit Quality Assurance Controls. No deficiencies were noted.

3. Other Review Areas

The following reviews not directly within the scope of Inspection Procedure 35006, but within the scope of Section 17.1.1 of RS-002, were inspected by the team in support of development of applicable sections of the NRC staff's safety evaluation report.

3.A Materials Handling

a. Inspection Scope

Project procedures were reviewed to determine materials handling requirements applicable to materials within the scope of the ESP. The objective was to verify that these requirements are equivalent in substance to measures provided in 10 CFR 50 Appendix B and Section 17.1.1 of RS-002 for those materials that might affect the reliability and integrity of data that would affect the capability of structures, systems, and components (SSCs) important to safety. Audit reports were reviewed for issues and corrective actions related to materials handling. The dedicated storage area for ESP materials (core and soil samples) was inspected for the purpose of observing materials storage conditions.

b. Observations and Findings

Section 14 of the Nuclear Quality Assurance Manual, "Handling, Storage, and Shipping," stated that measures had been established in administrative processes for classification, packaging, cleaning, preservation, shipping, storage, and handling of materials and equipment. The section further stated that these procedures defined responsibility, levels of cleanliness, tagging, and storage levels. They also provided for

measures to preclude damage, loss, or deterioration by environmental conditions. The section also noted that VEP-1-5A, Table 17.2-0, contained standards, requirements, or guides on which implementing procedures were based.

Section 17.2.13 of VEP-1-5A noted that such measures had been established and that their implementation was verified through inspections. Table 17.2-0 indicated that Dominion complied with Regulatory Guide 1.38, "Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Water-Cooled Nuclear Power Plants" (Revision 2, May 1977,) with specified clarifications and exceptions which met or exceeded the requirements of the Regulatory Guide.

Dominion's applicable lower-tier administrative procedure was VPAP-0703, "Storage, Handling, and Shipping Requirements for Plant Materials" (Revision 9). This procedure specified responsibilities for materials handling, provided specific requirements and guidelines for packaging and for storage areas, and provided storage environments in terms of Levels A through D.

The ESP materials were being stored at the most stringent level, A, which is intended to maintain materials exceptionally sensitive to environmental conditions that require special protection against temperature and humidity changes, physical damage, and airborne contamination. Such storage is required to be in a fire-resistant, weather-tight, well-ventilated building or enclosure, not subject to flooding, temperature and humidity controlled, and ventilated via filters.

Storage facilities for ESP materials, provided at the North Anna site, were inspected. The materials are stored on pallets in a Level A facility, in a dedicated, locked cage. The temperature, airflow, and humidity appeared to be consistent with a facility subjected to stringent climate control. All materials were found to be stored in sturdy wooden crates or in sealed glass jars stored in compartmented boxes.

MACTEC Work Plan Number 1, "Geotechnical Services, Early Site Permitting Project, North Anna Power Station" (Revision 0 issued November 22, 2002) contained instructions for handling core materials and samples prior to storage or testing. It required that disturbed soil sampling be performed in accordance with ASTM D1586, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"; undisturbed sampling be performed in accordance with ASTM D1587, "Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Projects"; and sample handling follow ASTM D4220, "Standard Practices for Preserving and Transporting Soil Samples". The Work Plan also provided additional instructions, by reference to the MACTECH Quality Assurance Project Document (QAPD), on specific measures to be taken in the handling of samples.

The team reviewed the core and soil sample inventory log. Samples were found to be uniquely identified, and a check of several log entries against stored samples found no inconsistencies. The team noted that several of the inventory sheets indicated that samples were prepared and checked by the same person, while others were apparently not checked. While this practice increases the chance of an error, no performance issues were noted as a result of this practice, because the MACTECH QAPD

requirement to maintain a sample inventory at the site storage facility did not require independent verification of the inventory.

An internal audit of ESP materials handling measures was performed in August 2003 by Dominion's Nuclear Oversight staff. A number of enhancements were recommended by the audit team, including better labeling of materials containers to specify storage level, placing signs on the entrance to the storage area, adding wax to the jar lids to better seal the jars, and taking measures to better control the sample logbook.

The Dominion ESP staff stated (memorandum from M.L. Smith to R.M. Berryman dated October 20, 2003) that appropriate enhancements had been implemented. The team noted the presence of the sign on the entrance to the storage area; noted that the several sample jars that were observed, were found to be sealed with wax; and that visible sample containers were noted to be labeled with required storage condition.

c. Conclusions

Based on the above noted observations, the team concluded that materials handling measures supporting the ESP application are equivalent in substance to the measures specified in 10 CFR Part 50 Appendix B, and consistent with the guidance on materials handling in Section 17.1.1 of RS-002.

3.B. Procedure Control

a. Inspection Scope

Project procedures were reviewed to determine procedure control requirements and to verify that these requirements are equivalent in substance to measures provided in 10 CFR 50 Appendix B and Section 17.1.1 of RS-002. Applicant and contractor audit reports were reviewed for issues and corrective actions related to procedure control. Original copies of approved procedures were examined for appropriate signature approvals.

b. Observations and Findings

Dominion ESP Quality Assurance Manual Section 7, "Document Control," stated that measures were established and documented for control of procedures, to provide for review, approval, issues, and changes thereto. It required that changes were normally to be approved by the same organization that performed the initial review and approval, though that approval may be delegated. The section added that procedures were processed, distributed, and controlled, and obsolete copies were disposed of, and that records of all procedure holders were maintained. An index of procedures, and the latest version of each, was also maintained. Section 7 also stated that measures for procedure control were addressed in station administrative procedures, and that Table 17.2-0 of VEP-1-5A contained requirements, standards, and guides on which the implementing procedures were based. This table stated that Dominion complied with Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operation), with exceptions and clarifications which meet or exceed the requirements noted.

ESP-002, “Procedure Control” (Revision 0) provided a method to control ESP project procedures. It discussed responsibilities and stated that the Project Manager for the ESP Project identified procedures and guidelines needed. The procedure required that all ESP procedures contain an independent review, and provided the approval authority. It also noted that procedures were required to be maintained consistent with ESP-002 and with Nuclear Design Control Program (NDCP) procedures and engineering standards.

The Nuclear Design Control Program is detailed in NDCM 2.1, “Nuclear Design Control Program.” Section 6.2 of this document addressed review and revision of procedures and standards, including methods of, and reasons for, changes to procedures. While this document addressed procedures in general, it does not address ESP procedures in particular.

VPAP-0601, “Document Distribution and Control” (Revision 12) provided expectations for procedure use. Section 5.1 stated that all procedure users in the Nuclear Business Unit were responsible for verifying that only the latest approved documents were used to perform work activities. VPAP-0601 also provided instructions for procedure distribution to ensure that users had the latest approved version of a procedure available at the job site.

DNAP-1907, “Human Performance (HU) Program” (Revision 2), Attachment 13 addressed procedure compliance. It required that Nuclear Business Unit employees strictly adhere to procedures, that procedure users ensure that procedures in use were approved and appropriate for the specific tasks or evolutions (to be performed), and that procedures be verified prior to use to ensure they are the current and approved revision. The attachment to DNAP-1907 directed that, if an activity had been determined to require a written procedure, the procedure shall be used to perform that activity.

VPAP-0502, “Procedure Process Control” (Revision 27) contained requirements for developing and revising procedures and for removing superseded procedures from use. The procedure described intent versus non-intent changes and explained approval authority for each. It also described how changes were implemented, including considerations if work is in progress when a change becomes effective. In addition, it described how hard-copy procedures, if maintained, are distributed, and it addressed the Electronic Procedure Distribution System (EDPS), a computer program used for electronic distribution of procedures. Applicant staff stated that all ESP procedures were maintained and distributed electronically. VPAP-0502 also contained requirements for revising procedures.

A sample of original ESP procedures was reviewed at the Innsbrook Records Management Center. They were found to have approval signatures consistent with ESP-002 requirements.

Bechtel Procedures 3DP-G01-00001, “The EDP System” (Revision 003) and 24830-001-3DP-G01-0001, “The EDP System” (Revision 000) provided Bechtel requirements for preparation, application, control, maintenance, and compilation in the controlled document data base. Section 3.0 of 3DP-G01-00001 stated that all Engineering Department Procedures (EDPs) must be prepared under the direction of the

Engineering Committee and issued for review and comment by the cognizant Managers of Engineering, as well as by other managers, to allow a cross-functional review. Approval level was specified as the Bechtel Corporate Manager of Engineering. The Manager of Quality Assurance/Quality Services was required to review EDPs.

Engineering Department Instructions (EDPIs), which modified EDPs for specific projects or were developed to provide a project-specific procedure where no EDP existed, had different specified management approval levels. Section 3.3 required that procedure revisions be approved in the same manner as specified for new procedures. Section 3.5 contained requirements for control and distribution of procedures. The section specified that procedure users were responsible for ensuring that copies downloaded or printed from the corporate data base were the latest revision. Original procedures were maintained by the Bechtel Document Management Center. Section 3.6 stated that Project Engineers were responsible for identifying applicable EDPs and EDPIs.

Audits of and by Dominion and its contractors and subcontractors were examined for issues and corrective actions related to procedure control and usage. A Bechtel audit of MACTEC in November 2002 resulted in a finding that a laboratory supervisor was using an obsolete version of the MACTEC QA Manual and that the supervisor was unaware of the recent revision to the QA Manual. MACTEC found that the cause was a time lag from revision approval to user notification. The corrective action was a commitment to require prompt notification of future revisions. The corrective actions were determined to be satisfactory by Bechtel on November 25, 2002.

c. Conclusions

The team concluded that procedure control measures supporting the ESP application were equivalent in substance to the measures specified in 10 CFR Part 50 Appendix B, and consistent with the guidance on document control in Section 17.1.1 of RS-002.

Management Meetings

Exit Meeting Summary

The team presented the inspection results to members of the applicant's management at the conclusion of the inspection on November 20, 2003. The applicant acknowledged the findings presented.

Documents containing proprietary materials were reviewed during the inspection. The team returned these materials to the applicant at the completion of the inspection. The team assured the applicant's management that proprietary information would not be included in the report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Applicant
T. Banks, ESP Environmental Lead
D. Batalo, ESP Project Engineer
R. Berryman, Director, Nuclear Oversight
T. Brunelli, Audit Coordinator
E. Grecheck, Vice President, Nuclear Support
J. Hegner, ESP Licensing Lead Engineer
K. Rhoads, Nuclear Oversight
S. Semmes, ESP Technology Lead Engineer
M. Smith, ESP Project Manager

Bechtel
R. Baker, ESP Project Engineer
S. Routh, ESP Project Manager

MACTEC Engineering and Consulting
A. Tice, Project Principal Engineer

Risk Engineering, Inc.
R. McGuire, President

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

52-008/2003-01-01, Validation Requirements for Website Data used in License Applications

Attachment

DOCUMENTS REVIEWED

Dominion Quality Assurance Manuals,

- "Early Site Permit Application Development Quality Assurance Manual," Revision 0
- "Early Site Permit Application Development Quality Assurance Manual," Revision 2
- VEP-1-5A, "Operational Quality Assurance Program Topical Report, (Update March 1998)

Early Site Permit Project, Project Manual

- ESP-001, "ESP Project Organization and Responsibilities," Revision 0
- ESP-002, "Procedure Control," Revision 0
- ESP-003, "Personnel Qualification and Training," Revision0
- ESP-004, "ESP Application Development," Revision 0
- ESP-005, "Discrepancy Management," Revision 0

Dominion General Nuclear Standards

- STD-GN-0003, "Standard for Determining SSC Classification," Revision 14
- STD-GN-0009, "General Drawing Standard," Revision 11
- STD-GN-0033, "Secondary Piping and Component Inspection Program," Revision 9
- STD-GN-0041, "Instructions for Engineering Transmittals," Revision 18
- STD-GN-0042, "Instructions For Architect Engineers" Revision 1

Dominion Station Administrative Procedures

- VPAP-0306, "Station Software Control," Revision 7
- VPAP-0502, "Procedure Process Control," Revision 27
- VPAP-0601, "Document Distribution and Control, Revision 12
- VPAP-0703, "Storage, Handling, and Shipping Requirements for Plant Materials, Revision 9
- VPAP-0901, "Records Retention and Files Management," Revision 8
- VPAP-1501, "Deviations," Revision 16
- VPAP-1601, "Corrective Action," Revision 18
- VPAP-1701, "Records Management," Revision 15
- VPAP-1907, "Human Performance (HU) Program, Revision 2
- VPAP-2301, "Nuclear Personnel Qualifications," Revision 6
- VPAP-2808, "NRC Licensing Correspondence," Revision 4

Dominion Department Administrative Procedures

- DMAP-0901, "Records Retention and Files Management," Revision 8
- MMAP-0012, "Vendor Surveilance Program," Revision 4
- MMAP-0016, "Procurement Technical Evaluation Determination," Revision 7

Dominion Nuclear Design Control Manual

- NDCM 2.1, “Nuclear Design Control Program,” Revision 22
- NDCM 3.3, “Design Verification,” Revision 9
- NDCM 3.4, “Engineering Change Requests,” Revision 8
- NDCM 3.5, “Design Basis Document Program,” Revision 11
- NDCM 3.6, “Procurement of External Engineering Services,” Revision 8
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LIST OF ACRONYMS USED

ANSI	American National Standards Institute
ARA	Applied Research Associates
ASME	The American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
CAR	Corrective Action Request
DCCL	Design Control Checklist
EDP	Engineering Department Project
EDP	Engineering Department Procedures
EDPI	Engineering Department Instructions
EDPS	Electronic Procedure Distribution System
EPA	Environmental Protection Agency
ESP	Early Site Permit
ISFSI	Independent Spent Fuel Storage Installation
ISO	International Organization for Standardization
LLC	Limited Liability Company
M&TE	Measuring and Test Equipment
NAPS	North Anna Power Station
NDCM	Nuclear Design Control Manual
NDCP	Nuclear Design Control Program
NOAA	National Oceanic and Atmospheric Administration
NQA	Nuclear Quality Assurance
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
NRRL	Nuclear Required Records Lists
NUPIC	Nuclear Utility Procurement Issues Committee
PE	Project Engineer
PEP	Project Execution Plan
PEPM	Project Engineering Procedures Manual
PM	Project Management
PO	Purchase Order
PPR	Potential Problem Reporting
QA	Quality Assurance
QAM	Quality Assurance Manual
QAP	Quality Assurance Program
QAPD	Quality Assurance Project Document
QAPP	Quality Assurance Program Plan
QC	Quality Control
REI	Risk Engineering, Inc.
RG	Regulatory Guide
RS	Review Standard
SQAP	Software Quality Assurance Plan
SSAR	Site Safety Analysis Report
SSC	Structures, Systems, and Components
V&V	Verification and Validation